INTRODUCTION

The 2006 Water Quality Assessment Integrated Report is a summary of the water quality conditions in Virginia from January 1, 2000 to December 31, 2004. The Virginia Department of Environmental Quality (DEQ), with assistance from the Virginia Department of Conservation and Recreation (DCR), develops and submits the report to the U.S. Environmental Protection Agency (EPA) and the U.S. Congress every even-numbered year. The report satisfies the requirements of the U.S. Clean Water Act (CWA) Sections 305(b) and 303(d) and the Virginia Water Quality Monitoring, Information and Restoration Act (WQMIRA) § 62.1-44 19:4 through 62.1-44-19.8 of the Code of Virginia.

The goals of Virginia's water quality assessment program are to determine whether waters meet water quality standards and then design and implement a plan to restore waters with impaired water quality. Water quality standards designate uses for waters. There are six designated uses for surface waters: aquatic life, fish consumption, shellfish consumption, swimming, public water supplies (where applicable), and wildlife. Additionally, several new subcategories of aquatic life use have been adopted for estuarine waters of the Chesapeake Bay and its tidal tributaries. The standards define the water quality needed to support each of these uses. If a waterbody contains more contamination than allowed by water quality standards, it will not support one or more of its designated uses. Such waters have "impaired" water quality.

Both human (anthropogenic) activities and natural processes cause impaired water quality. All anthropogenic impaired waters in Virginia are placed on a federally mandated 303(d) List. Waters that are impaired due to human activities and pollutants require a plan to restore their water quality. DEQ schedules each of these waters for development of a plan that defines the limit of a pollutant that water can receive and still meet water quality standards. This plan is called a total maximum daily load or a TMDL. An implementation plan is developed after a TMDL is approved. Once fully implemented, a TMDL Implementation Plan will restore impaired waters and maintain their improved water quality.

As in 2004, the EPA wants states to fully integrate two reports required under different sections of the CWA. Section 305(b) requires states to submit a report on all information regarding its waters, and Section 303(d) requires a list of waters with impaired water quality. The 2004 water quality assessment was the first one compiled by Virginia to combine both reports.

Significant Changes and Additions to the 2006 Water Quality Assessment Integrated Report

In 2003, EPA developed five main categories with several subcategories for an overall rating of all surface waters. Virginia further subcategorized some of the five EPA categories in the 2004 report to facilitate follow-up monitoring and other agency tracking needs. Additional subcategories had to be added in 2006 to track the conditions of waters with adopted TMDLs. Information regarding this new categorization and other associated assessment methodologies can be found in Chapter 2.2 of this report and/or the 2006 Assessment Guidance Manual found on the DEQ water website at www.deq.virginia.gov/wqa.

New Water Quality Standards for Dissolved Oxygen and Submerged Aquatic Vegetation in the Chesapeake Bay and its tidal tributaries were adopted and assessed in the 2006 Water Quality Assessment Integrated Report and are found in Chapter 6.7. Additional Water Quality Standards for dissolved oxygen (including site-specific criteria for the Mattaponi and Pamunkey Rivers) as well as for chlorophyll *a* and water clarity will be assessed in 2008.

WQMIRA requires an analysis of water quality trends. In 2004, DEQ contracted the development of new trend data analysis software and in 2005 completed a major update of trend analysis for Virginia's waters. The results of this trend analysis are discussed in more detail in Chapter 2.4 of the 2006 report. The trend results should not be interpreted as representative of the current condition of waters statewide, but rather they summarize the significant direction of changes in water quality for certain selected parameters over the past twenty years. In cases where a trend is apparent, results indicate a general improvement in water quality between 1985- 2005.

Public beach areas have been assessed for the first time in the 2006 report. In 2002, under amended Section 303 of the Federal Water Pollution Control Act (33 U.S.C. 1313 ("Beaches Environmental Assessment and Coastal Health (BEACH) Act), the Virginia Department of Health (VDH) Office of Epidemiology initiated the Virginia BEACH Monitoring Program. The data collected by VDH during the 2006 reporting period has been

provided to DEQ and included in the overall water quality assessment of state waters for primary contact recreation designated use. See Chapter 2.1 (BEACH Monitoring Program) for more information on the monitoring and assessment of Virginia's beaches.

Data Used To Determine Water Quality

There are two basic types of water quality data used in the assessment process. The first type is "monitored" data approved through the quality assurance/quality control process (QA/QC). The data come from stream monitoring—the collection and analysis of chemical, biological, and physical samples taken by DEQ and any other DEQ-approved data. These data are considered of the highest quality. Normally, the U.S. impaired waters list as determined by the EPA consists of only QA/QC-approved monitored data. Monitored data are obtained using EPA-accepted methods and DEQ-approved protocols. All non-DEQ monitoring submittals, except chemical data submittals from the U.S. Geological Survey, must provide a sampling and analysis protocol and all field data for review.

The second type of data used in the assessment is considered "evaluated" data. These physical, chemical, and biological data are primarily obtained from sources without an EPA- or DEQ-accepted sampling protocol. These data are considered to be of lower quality than the monitored data with little confidence in their results and normally are not used directly for listing waters as impaired. Additionally, waters that were on previous impaired waters lists but do not have any additional monitoring data for the 2006 assessment period will reflect the results of the previous assessment for the associated designated uses.

Another important modification to the 2006 assessment is the revision of the method used to assess estuarine benthic data from the Chesapeake Bay Program. Since the 2004 report, EPA, Virginia and the state of Maryland have continued to work together to improve the method to assess the benthic index of biological indicators (B-IBI) randomly collected by the Chesapeake Bay Program.

Planning though 2008 and Beyond

The 2006 report will be the last Water Quality Assessment Integrated Report in Virginia with a five-year reporting period. In the 2008 and future reports, DEQ will employ a six-year reporting period in order to include one complete statewide watershed monitoring rotation in each assessment. This change will help to increase the number of definitive assessment determinations that can be made in a given report. In addition, DEQ will schedule future revisions of Virginia's Water Monitoring Strategy to coincide with the beginning of each six-year watershed monitoring rotation cycle. This will enable DEQ to redirect available water monitoring resources, as needed, based on data collected from across the state. The strategy includes a 2005 - 2014 implementation plan. In addition to revisions of the strategy in both 2007 and 2013, the implementation plan will also be updated in 2010.

By 2007, DEQ will complete both monitoring and data analysis from a five-year probabilistic monitoring study (Probmon) in freshwater, free-flowing streams. This analysis will provide a statistically supported statewide snapshot of water quality and the predominant sources of water quality problems. Virginia Commonwealth University, with support from DCR, is also doing independent work on aquatic community health. A summary of this work is included in Chapter 2.1 (INSTAR Assessment Tool) of the 2006 report. As part of the free-flowing probabilistic monitoring study, stream habitat is being analyzed to determine if benthic habitat is being negatively affected. Final results of DEQ's "Freshwater Probmon Study" will be reported in the 2008 Water Quality Assessment Integrated Report.

Equally important for assessments in the future is the increased inclusion of non-DEQ water quality data. While quality assurance and quality control (QA/QC) continues to be a concern for direct use of outside data, DEQ is making a considerable effort to improve the data quality of outside providers by reviewing monitoring protocols and suggesting means for improving data quality. Our objective is to certify additional non-DEQ QA/QC data for designated use determination in the overall statewide water quality assessment.

For more information relating to water quality programs and initiatives visit the DEQ web site at www.deq.virginia.gov/water.